

DIN EN 13146-4:2020-06 (E)

Railway applications - Track - Test methods for fastening systems - Part 4: Effect of repeated loading

Contents		Page
European foreword		4
1	Scope	5
2	Normative references	5
3	Terms, definitions, symbols and abbreviations	5
3.1	Terms and definitions	5
3.2	Symbols and abbreviations	6
4	Principle	7
5	Apparatus	7
5.1	Rail	7
5.2	Actuator	7
5.3	Load application head	7
5.4	Displacement-measuring instruments	7
5.4.1	Calibration procedure	7
5.4.2	Calibration requirement	7
5.4.3	Fixtures for mounting displacement-measuring instruments	8
5.5	Force-measuring instruments	8
5.6	Verification of calibration	8
6	Test specimens	8
6.1	Sleeper or other rail support	8
6.2	Fastening	8
7	Procedure for one rail	8
7.1	General	8
7.2	Preparation for test	9
7.2.1	In line fastening	9
7.2.2	Offset fastening	9
7.3	Clamping force	9
7.4	Longitudinal rail restraint	10
7.5	Vertical stiffness of fastening assembly	10
7.5.1	Static stiffness	10
7.5.2	Low-frequency dynamic stiffness	10
7.6	Cyclic loading	10
7.6.1	Preparation for the cyclic load test	10
7.6.2	Preliminary load cycles	11
7.6.3	Continuation of the repeated load test	11
7.6.4	Results required from the repeated load test	11
7.7	Repeat tests	15
7.8	Final inspection	15
8	Alternative test procedure	15
8.1	General	15
8.2	Apparatus	15
8.2.1	General	15
8.2.2	Loading frame	15
8.3	Procedure	16

8.3.1	General	16
8.3.2	Preparation for test	16
8.3.3	Clamping force	16
8.3.4	Longitudinal rail restraint	17
8.3.5	Vertical stiffness	17
8.3.6	Cyclic loading	17
8.3.7	Repeat tests	17
8.3.8	Final inspection	17
9	Test report	18
	Bibliography	19